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Claims

1. An exercise apparatus which comprises a resistance means able to provide resistance to a movement by a user and a vibration means able to impart a vibration to the user, which vibration acts on a muscle or muscle group being exercised and in which the energy for the vibration means is provided by a movement or movements of the user.
2. An exercise apparatus as claimed in claim 1 in which the resistance means comprises free weights, a weight machine, a spring or hydraulic resistance.
3. An exercise machine as claimed in claim 1 or 2 in which the user holds a grip, bar or handle and the vibration means acts on the grip, bar or handle.
4. An exercise apparatus as claimed in any one of claims 1 to 3 in which the vibration means is connected to a part of the apparatus which is to be linearly moved and converts the linear motion to an intermittent rotational motion.
5. An exercise apparatus as claimed in claim 4 in which there is a cable or belt attached to the moving part of the apparatus, which cable or belt passes over a pulley which connects to the means for providing the vibration.
6. An exercise apparatus as claimed in claim 4 or 5 in which the rotational motion is made intermittent by means of a stick/slip mechanism, intermittent braking mechanism or a ratchet mechanism.
7. An exercise apparatus as claimed in any one of claims 4 to 6 in which there is a handle attached to a cable or belt, which cable or belt passes between two rollers that rotate as the cable or belt passes between them, the cable or belt connecting to a weight to be lifted and in which one of the rollers has areas of raised rubber equally

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spaced around the roller so that these areas exert a greater resistance to the cable or belt as this roller rotates and comes into contact with the other roller.

5 8. An exercise machine as claimed in any one of claims 1 to 5 in which the vibration means comprises a fluid pumping means which is operated by a movement or movements of the user and a control means for intermittingly varying the flow of fluid through the pumping means.

10 9. An exercise machine as claimed in claim 8 in which the fluid is air or a hydraulic liquid.

10. An exercise machine as claimed in claim 8 or 9 in which the control means is an on/off valve.

15 11. An exercise machine as claimed in any one of claims 8 to 10 in which the pumping means comprises a cylinder pump or a rotary pump.

20 12. An exercise machine as claimed in any one of claims 8 to 11 in which the control, valve comprises a switchable valve system allowing single or double action damping controlled by simple manual or mechanical means, or under electronic hardware or programmable software control.

25 13. An exercise machine as claimed in any one of the preceding claims in which the frequencies of vibration are from 5 to 100 Hz.

14. An exercise machine as claimed in any one of the preceding claims in which the frequencies of vibration are from 10 to 50Hz.

30 15. An exercise apparatus as claimed in claim 1 in which the muscle groups being exercised are the breathing muscles and the vibration means acts on the flow of air

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being breathed, which apparatus comprises a breathing means through which a user can breath and an air flow interruption means connected to the breathing means, which interruption means is adapted to cause a periodic interruption to air flowing through the interruption means to the breathing means.

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16. An exercise apparatus as claimed in claim 15 in which the breathing means comprise a mouthpiece adapted to fit over the mouth and nose of the user.

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17. An exercise apparatus as claimed in claim 16 in which the interruption means produces regular periodic interruption to the flow of air reaching the mouthpiece and being breathed by a user.

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18. An exercise apparatus as claimed in claim 17 in which the interruption means comprises a valve mechanism such as a reed or other oscillating valve system and the air passing through valve mechanism is regularly interrupted.

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19. An exercise apparatus as claimed in claim 17 in which the interruption means comprises a mechanically or electrically controlled valve mechanism which regularly and periodically interrupts the flow of air.

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20. An exercise apparatus as claimed in claim 17 in which the interruption means comprises two discs, at least one of which can be rotated relative to the other, with each of the discs having at least one hole in it; the discs being positioned in the air flow so that, as one of the discs rotates relative to the other disc, the holes in the two discs are coincident periodically so as to form a continuous air flow passage.

21. An exercise apparatus as claimed in any one of claims 15 to 20 in which the frequency of the interruptions to the flow of air is in the range of 5 to 100 Hz.

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